1,182,470

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,182,470

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Date of filing Complete Specification: 25 Nov., 1968.

Date of Application (No. 54751/67): 1 Dec., 1967.

Complete Specification Published: 25 Feb., 1970.

Index at acceptance:—B3 A(26, 75, 137); B1 D(1B4, 2N1, 3C)

International Classification:—B 30 b 9/26

COMPLETE SPECIFICATION

Hard Faced Bars

We, ROSE, DOWNS & THOMPSON LIMITED, a British company of Old Foundry, Cannon Street, Kingston-upon-Hull, Yorkshire do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to hard faced lining bars of the type described in British patent specification No. 1036823. Such lining bars are mounted adjacent one another with their lengths parallel to form a cage lining in, for example, a screw press, narrow escape channels being formed between adjacent bars. Such an arrangement of lining bars is shown in Figure 2 of the abovementioned specification.

While the lining bars of British patent specification No. 1036823 are an improvement over previously known lining bars, they are to an extent unsatisfactory, in that wear of the mild steel, below the hard faced lining occurs in use.

By "inner face" in this specification is meant that face of the bar which is innermost, when the bar forms a component part of a cage.

One aspect of the present invention resides in a method of making a lining bar in which a bar of a relatively soft metal is formed over its inner face with a wear resisting metallic material extending to the sides of the bar, and in which the wear resisting material is introduced into a groove in at least one side face of the bar extending to a point adjacent to but displaced from the inner face lining.

Preferably the bar is made from mild steel and the wear resisting metallic material is that sold under the Trade Mark "Stellite."

Another aspect of the invention resides in a lining bar comprising a bar of relatively soft metal, having a lining of a wear resisting metallic material extending over its entire inner face, and further wear resisting metallic material deposited in a groove in at least one side face, the groove extending to a point adjacent to but displaced from the inner face lining.

The invention makes use of the surprising discovery that alloying occurs between the wear resisting material and the relatively soft metal adjacent the points of deposition. Thus, that face of the metal bar that is unprotected by a directly deposited layer of the wear resisting material, i.e. between the inner face lining and the adjacent end of the groove in the side face, becomes alloyed with the wear resisting material and thereby becomes itself wear resisting.

Both the inner and the outer faces of the bar may be lined with the wear resisting material, the groove or grooves in the side face or faces extending adjacent to but separated from the inner and outer faces. In this manner, the bar may be reversed, when substantial wear of the inner face has occurred.

The lining bar may be hardened by heat treatment after the wear resisting material has been applied. This has been found to increase the resistance of the bar to wear without making it undesirably brittle.

The invention will be more readily understood by way of example from the following description of a lining bar and the mode of making it, reference being made to the drawing accompanying the provisional specification, in which

Figures 1 to 4 shows the bar in cross section in progressive stages of manufacture,

Figure 5 shows the final bar in cross section.

For a non-reversible bar, a mild steel bar 12 with dimensions in width and depth slightly exceeding the final dimensions, is machined on its inner face to form a constant depth groove 13 extending the full length of the bar. Wear-resisting metal material, sold under the Trade Mark "Stellite" is deposited at 14 in the groove 13. The "Stellite" is deposited by arc welding or oxy-acetylene welding techniques.

In the second stage of production of the bar,

[*Price 5s. 0d.*]

the side faces are ground away to leave exposed the sides of the Stellite lining 14 and the inner face of that lining is ground flat. In Figure 2, the original side faces of the bar 12 are shown in chain line at 15.

Grooves 16 are now milled in the side faces of the bar 12, below the level of the layer 14. As shown, the grooves 16 are of constant depth and extend to a point adjacent to, but separated from, the lining 14; thus, there is a small area 17 of mild steel between the grooves and the lining 14. Stellite is now deposited in the grooves 16 to form the side linings 18. The side linings 18 are ground flat in Figure 4 and then the lined bar is ground to the final required dimensions as shown in Figure 5. The outer face of the bar 12 is ground in preference to the inner face since the mild steel is substantially softer than the Stellite. In that Figure the dimensions of the illustrated embodiment are as follows: the inner face is 0.390 inches, the outer face 0.422 inches, the side face 1.00 inches, the inner Stellite lining 14 is approximately 0.094 inches and the side linings 18 approximately 0.039 inches. The angles are as marked in Figure 5.

Although the areas between the lining 14 and the upper extremities of the side linings 18 have no protective deposition of Stellite, it has been found that in fact those areas have wear-resisting properties, due to substantial alloying that occurs between the Stellite and the mild steel adjacent the areas of deposition. Unexpectedly, therefore, little undercutting of the inner face lining 14 occurs during operation.

If a reversible lining bar is required, the outer face of the bar 12 (the lowermost face as shown in the Figures), may be treated as the inner face to apply a layer of Stellite thereto. In this case, again, a small area free of deposited Stellite is left between the side linings 18 and the lining for the outer face.

If desired, the Stellite bars may be hardened by heating the bars and then quenching. It has been found that this treatment does not reduce the effectiveness of the Stellite depositions in resisting wear and corrosion, while adding to the wear resistant properties of the otherwise soft steel.

WHAT WE CLAIM IS:—

1. A method of making a lining bar in which a bar of a relatively soft metal is formed over its inner face with a wear resisting metallic material extending to the sides of the bar, and in which the wear resisting metallic material is introduced into a groove in at least one side face of the bar extending to a point adjacent to but displaced from the inner face lining.

2. A method as claimed in claim 1 in which the wear resisting material is introduced into grooves on both side faces of the bar.

3. A method as claimed in claim 1 or 2 in which both the iner and outer faces are lined with wear resisting metallic material and in which the groove or grooves in the side face or faces extend adjacent to but separated from the inner and outer faces.

4. A method as claimed in any one of claims 1 to 3 in which the lining bar is hardened by heat treatment after the wear resisting material has been applied.

5. A cage lining bar for a screw press, comprising a bar of relatively soft metal having a lining of a wear resisting metallic material extending over its entire inner face, and further wear resisting metallic material deposited in a groove in at least one side face, the groove extending to a point adjacent to but displaced from the inner face lining.

6. A cage lining bar as claimed in claim 5 in which the wear resisting metallic material is deposited in grooves in both side faces.

7. A cage lining bar as claimed in claim 5 or 6 having a lining of the wear resisting metallic material extending over its entire outer face.

8. A screw press having a cage comprising a plurality of lining bars, each of the type claimed in any one of claims 5 to 7.

9. A method of making a lining bar substantially as hereinbefore described with reference to the drawings accompanying the provisional specification.

10. A cage lining bar for a screw press substantially as hereinbefore described with reference to the drawings accompanying the provisional specification.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1970.
Published by the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

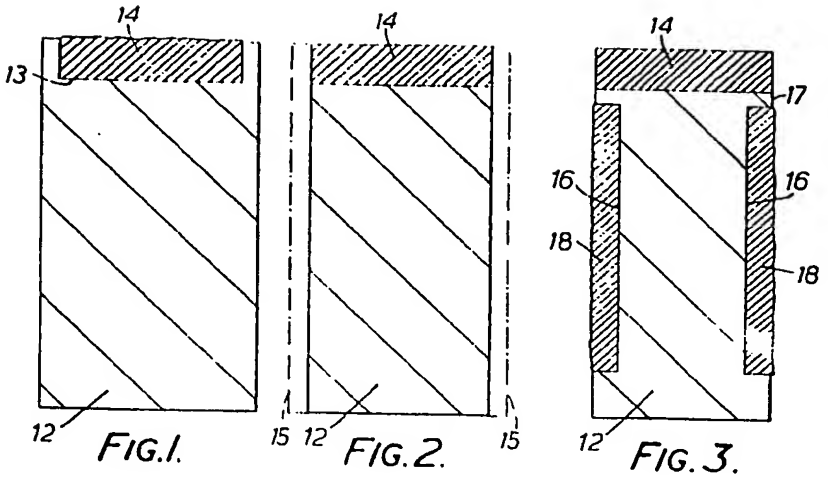

FIG.1. FIG.2. FIG.3.

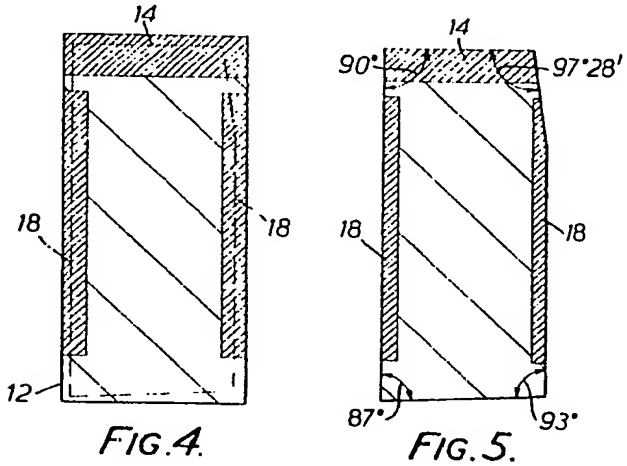

FIG.4. FIG.5.